

REMARKS:

Claims 1, 2 and 10 are in the case and presented for consideration.

Claims 1-10 have been rejected as being fully anticipated under 35 U.S.C. 102(b) by US Patent 5,468,390 to Crivello et al. (Crivello), and Claims 4 and 7-9 have been rejected as being obvious under 35 U.S.C. 103(a) from Crivello taken in view of either US Patent 6,039,872 to Wu et al. (Wu) or US Patent 5,885,456 to Charkoudian et al. (Charkoudian).

Claims 1, 2, 3, 5, 6 and 10 have also been rejected under non-statutory, obviousness-type double patenting.

Claim 1 has been amended to include the limitations of canceled Claim 3, and canceled Claim 4, but without the washing agents of acids or other hydrocarbons. Claim 10 and dependent Claim 2, are also limited to the energy values for the UV irradiation that is supported by the specification at page 15 lines 1 and 14, and to the use of the preferred washing agents for Claim 10 and ethanol for Claim 2, and to polyethersulfone membranes specifically in both of Claims 2 and 10.

The double patenting rejections are therefore respectfully traversed.

Claims 1, 2 and 10 are also believed to be novel over Crivello since Crivello neither includes a washing step with the washing agents listed in these claims, nor does Crivello suggest or teach the power limitations for the UV irradiation which is extremely important for maximally effective grafted membranes.

As disclosed in the specification at page 14, lines 16-21, an energy level (E1) below which abundant chain scission (that is surface damage) is minimized and also a second energy (E2) at which maximum grafting occurs, must be found and used for the irradiation

step. This is in conjunction with selecting the correct monomer, namely AA (acrylic acid), and in conjunction with using the best photosensitive membrane material, namely PES (Claims 2 and 10).

While PES and acrylic acid are disclosed in Crivello, they are not used in conjunction with the irradiation limitations to maximize grafting while avoiding surface damage. In fact, chain scission is never a consideration in any of the references cited so that selecting the energy level for best grafting results would not be expected or obvious to those having ordinary skill in this field, having only the prior art teaching to rely on.

Further, the washing step taught by Crivello using water and even as supplemented by the soaking step in acid, is not the same type of washing now claimed which utilizes more conventional solvents such as ethanol which was found by the inventors to be particularly useful in removing entrapped homopolymers from the pores of the membrane on which AA has been grafted.

Accordingly, claims 1, 2 and 10 are believed to be novel over Crivello taken alone.

Turning to the obviousness rejections, while Wu teaches removing non-reacting residues from a membrane using methanol, these are not the homopolymers contemplated during the grafting of AA monomers onto polysulfone membranes of the type claimed. There would be no reason for the skilled artisan to reach Claim 1 or especially Claims 2 and 10 in any obvious manner by combining Crivello with Wu.

The combination of Crivello and Charkoudian would likewise not yield claims 1, 2 or 10 in an obvious manner.

The person of ordinary skill in this field, e.g. a chemist with years of experience and perhaps a graduate degree, would not appreciate the special selection of acrylic acid with

polysulfone and with the specified level of UV irradiation from Crivello alone or in combination with the secondary references. Crivello does not teach the same environment as Wu or Charkoudian so that combining Wu or Charkoudian with Crivello would not make it obvious to select the specified washing agents, in particular ethanol (Claim 2), to remove homopolymers.

Accordingly, the claims are also believed to be unobvious and the application and claims are believed to be in condition for allowance.

No new matter has been added and if any issues remain which may be resolved by telephone, the Examiner is respectfully invited to contact the undersigned at the number below.

Favorable action is respectfully requested.

Respectfully submitted,

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